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|---|---|
| BATTAGLIA, MICHAEL V | |
| **ART UNIT** | **PAPER NUMBER** |
| 2652 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/028,978 | KONDO ET AL. | |
| | Examiner | Art Unit | |
| | Michael V. Battaglia | 2652 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *14 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

*Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as obvious over Ohgo (US 6,269,072) in view of Takeda et al (hereafter Takeda) (US 6,512,735) and further in view of Ko et al (hereafter Ko) (US 6,813,230). See Response to Arguments below for additional explanation.

In regard to claim 1, Ohgo discloses an information recording medium comprising: a substrate (Fig. 1, element 2) having a microscopic pattern, having a continuous shape of approximately parallel grooves formed with alternating groove and land sections (Col. 16, lines 17-19); a recording layer formed on the microscopic pattern (Col. 16, lines 24-26); and a light transmission layer (Fig. 1, element 6) formed on the recording layer, wherein the microscopic pattern is formed so as to satisfy a relation of $P < \lambda/NA$ (Col. 16, lines 19-20 and 37-39), wherein P is a pitch of the groove section or the land section, $\lambda$ is a wavelength of reproducing light beam and NA is a numerical aperture of an objective lens. It is noted that Ohgo discloses the thickness of the light transmission layer to be 0.1 mm and within a range of 0.07 to 0. 12 mm (Col. 10, line 41; Col. 12, lines 34-35; and Col. 13, lines 41-42) and that Ohgo does not disclose any thickness of the light transmission layer (Fig. 1, element 6) other than 0.1mm. However, Ohgo does not specifically disclose the thickness of the light transmission layer used in Embodiment 9, which is the embodiment used in the present rejection. Ohgo also does not disclose that the land section is wobbled in the radial direction and having a wobbled shape corresponding to a superimposed

wave comprising a phase modulated wave and a single frequency wave, the single frequency wave being superimposed on the phase modulated wave and having a frequency of integral multiples or one over integral multiples of a frequency of the phase modulated wave.

Takeda teaches that by using a light transmission layer (Fig. 1, element 5) with a thickness of 0.1 mm and within a range of 0.07 to 0. 12 mm, it is possible to use an objective lens having a high numerical aperture with the information recording medium, reduce the laser spot size, and have an increased recording density (Col. 4, lines 10-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the thickness of the light transmission layer in the information recording medium of Ohgo be within a range of 0.07 to 0.12 mm as suggested by Takeda, the motivation being to have a thickness of the light transmission layer of Ohgo that works with the high numerical aperture of Ohgo and to, as a result, have increased recording density.

Ko discloses wobbling a land section (Fig. 6, "Land Track") is wobbled in the radial direction (Col. 5, lines 57-61) and having a wobbled shape corresponding to a superimposed wave (Fig. 10, "Land Recording Signal") comprising a phase modulated wave (Fig. 10, "Land Address Data" and Col. 6, lines 18-25) and a single frequency wave ("phase shifted wobble signal" of Col. 10, line 44 output from Fig. 10, elements 100 and 102 (Col. 10, lines 40-44)), the single frequency wave being superimposed on the phase modulated wave (Fig. 10, element 106 and Col. 10, lines 52-58) and having a frequency ("fw" of Col. 8, line 53 and Col. 10, line 41) of integral multiples or one over integral multiples of a frequency (1/("Tpid" of Col. 8, lines 45, 52 and 59)) of the phase modulated wave (Col. 8, lines 50-59 and note that fw is disclosed as preferably being integral multiples (i.e. 2, 3, 4, 5, 6 or 7 times 1/Tpid) of 1/Tpid). Ko teaches that doing so allows more data to be recorded in a recording medium (Abstract, particularly lines 15-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to wobble the land section in the information recording medium of Ohgo in the radial direction and having a wobbled shape corresponding to a superimposed wave comprising a phase modulated wave and a single frequency wave, the single frequency wave being superimposed on the phase modulated wave and having a frequency of integral multiples or one over integral multiples of a frequency of the phase modulated wave as suggested by Ko, the motivation being to allow more data to be recorded in the information recording medium.

In regard to claim 2, Ohgo discloses that a record based on at least one of reflectivity difference and phase difference is performed onto either one of the groove and land sections (Col. 3, lines 66-67 and Col. 9, lines 25-30).

In regard to claim 3, Ohgo discloses that the wavelength $\lambda$ is within a range of 350 to 450 nm (Col. 16, lines 38-39) and the numerical aperture NA is within a range of 0.75 to 0.9 (Col. 16, line 37).

In regard to claim 4, Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo does not disclose that the recording is performed so that the modulated amplitude exceeds 0.4.

Applicant defines a modulated amplitude as a mathematical relationship in the form of a ratio (Page 62, lines 15-19). Examiner concludes that this mathematical relationship is known. Examiner interprets the specification (JIS Standard X6241: 1997) as establishing a range of values for the terms of the mathematical relationship (I14H and I14L), hence establishing a range of modulated amplitudes.

In keeping with In re Peterson (65 USPQ2D 1379), it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the range of modulated amplitudes, the motivation being the inherent improvement of the optimization. Applicant's cooperation is respectfully requested in completing the search report by providing the Office with JIS Standard X6241: 1997.

In regard to claim 6, Ohgo discloses that the recording layer is formed by a phase change material (Col. 16, lines 24-26).

2. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Ko as applied to claim 2 above, and further in view of Misawa et al (hereafter Misawa) (US 5,948,593).

Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo does not disclose that the recording is performed so that the modulated amplitude exceeds 0.4.

Misawa discloses a modulated amplitude of 0.65 that is more than 0.4 and teaches that this value is good (Col. 54, lines 5-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform recording on the information recording medium of Ohgo so that the modulated amplitude exceeds 0.4 as suggested by Misawa, the motivation being to perform recording with a modulated amplitude value that is good.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Ko as applied to claim 2 above, and further in view of Watanabe et al (hereafter Watanabe) (US 4,651,172).

Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo does not disclose that the recording is performed so that the reflectivity exceeds 5%.

Watanabe teaches that when recording is performed with a reflectivity of less than 5%, the intensity of reflected light becomes lower and the signal/noise ratio of the reproduced signal deteriorates (Col. 2, lines 61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform recording on the information recording medium of Ohgo so that the reflectivity exceeds 5% as suggested by Watanabe, the motivation being for the intensity of reflected light to be high enough that the signal/noise ratio of the reproduced signal does not deteriorate.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Ko and further in view of Yamamoto et al (hereafter Yamamoto) (US 6,721,259).

Ohgo discloses an recording medium having: (a) a substrate (Fig. 1, element 2) having a microscopic pattern, having a continuous shape of approximately parallel grooves formed with alternating groove and land sections (Col. 16, lines 17-19); (b) a recording layer formed on the microscopic pattern (Col. 16, lines 24-26); (c) a light transmission layer (Fig. 1, element 6) formed on the recording layer; wherein the microscopic pattern is formed so as to satisfy a relation of $P < \lambda/NA$ (Col. 16, lines 19-20 and 37-39), wherein P is a pitch of the groove section or the land section, $\lambda$ is a wavelength of reproducing light beam and NA is a numerical aperture of an objective lens. It is noted that Ohgo discloses the thickness of the light transmission layer to be 0.1

mm and within a range of 0.07 to 0. 12 mm (Col. 10, line 41; Col. 12, lines 34-35; and Col. 13, lines 41-42) and that Ohgo does not disclose any thickness of the light transmission layer (Fig. 1, element 6) other than 0.1mm. However, Ohgo does not specifically disclose the thickness of the light transmission layer used in Embodiment 9, which is the embodiment used in the present rejection. Ohgo also does not disclose that the land section is wobbled in the radial direction and having a wobbled shape corresponding to a superimposed wave comprising a phase modulated wave and a single frequency wave, the single frequency wave being superimposed on the phase modulated wave and having a frequency of integral multiples or one over integral multiples of a frequency of the phase modulated wave.

Takeda teaches that by using a light transmission layer (Fig. 1, element 5) with a thickness of 0.1 mm and within a range of 0.07 to 0. 12 mm, it is possible to use an objective lens having a high numerical aperture with a recording medium, reduce the laser spot size, and have an increased recording density (Col. 4, lines 10-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the thickness of the light transmission layer in the recording medium of Ohgo be within a range of 0.07 to 0.12 mm as suggested by Takeda, the motivation being to have a thickness of the light transmission layer of Ohgo that works with the high numerical aperture of Ohgo and to, as a result, have increased recording density. Ohgo in view of Takeda does not disclose a reproducing apparatus for reproducing from the recording medium. It is noted that the recording medium of Ohgo is supported on a turntable (Fig. 1, element 4) while rotating.

Ko discloses wobbling a land section (Fig. 6, "Land Track") is wobbled in the radial direction (Col. 5, lines 57-61) and having a wobbled shape corresponding to a superimposed wave

(Fig. 10, "Land Recording Signal") comprising a phase modulated wave (Fig. 10, "Land Address Data" and Col. 6, lines 18-25) and a single frequency wave ("phase shifted wobble signal" of Col. 10, line 44 output from Fig. 10, elements 100 and 102 (Col. 10, lines 40-44)), the single frequency wave being superimposed on the phase modulated wave (Fig. 10, element 106 and Col. 10, lines 52-58) and having a frequency ("fw" of Col. 8, line 53 and Col. 10, line 41) of integral multiples or one over integral multiples of a frequency (1/("Tpid" of Col. 8, lines 45, 52 and 59)) of the phase modulated wave (Col. 8, lines 50-59 and note that fw is disclosed as preferably being integral multiples (i.e. 2, 3, 4, 5, 6 or 7 times 1/Tpid) of 1/Tpid). Ko teaches that doing so allows more data to be recorded in a recording medium (Abstract, particularly lines 15-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to wobble the land section in the recording medium of Ohgo in the radial direction and having a wobbled shape corresponding to a superimposed wave comprising a phase modulated wave and a single frequency wave, the single frequency wave being superimposed on the phase modulated wave and having a frequency of integral multiples or one over integral multiples of a frequency of the phase modulated wave as suggested by Ko, the motivation being to allow more data to be recorded in the recording medium.

Yamamoto discloses a reproducing apparatus comprising: a recording medium (Figs. 10 and 11, element 11); the recording apparatus further including (d) a pickup (Figs. 10 and 11, element 10) composed of a light emitting element (Col. 14, lines 45-46) having a wavelength of $\lambda$ within a range of 350 to 450 nm (Col. 22, lines 22-23) and an objective lens (Fig. 10, element 20) having a numerical aperture of NA within a range of 0.75 to 0.9 (Cols. 19-20, Table 4 and Col. 3, lines 1-3) for reading out reflected light from the information recording medium; (e) a

motor (Fig. 11, element 31) for rotating the information recording medium; (f) servo means (Fig. 11, element 32) for controlling the drive of the pickup and the motor; (g) a turntable (inherent because the information recording medium must be supported while rotating) for supporting the information recording medium while rotating; (h) demodulator means (Fig. 11, element 33) for demodulating an information signal read out by the pickup; (i) interface (I/F) means (Fig. 11, element 33) for transmitting a signal demodulated by the demodulator externally; and (j) controlling means (Fig. 11, element 35) for controlling the reproducing apparatus totally (Col. 16, lines 48-49).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to reproduce from the recording medium of Ohgo in view of Takeda and further in view of Ko using the reproducing apparatus of Yamamoto, the motivation being to reproduce information recorded on the recording medium. It is noted that the recording apparatus of Yamamoto comprises the recording medium of Ohgo in view of Takeda and further in view of Ko while the recording apparatus reproduces the information of the recording medium.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Ko and further in view of Yamamoto as applied to claim 7 above, and further in view of Tsukihashi (US 6,496,458).

Ohgo in view of Takeda and further in view of Ko and further in view of Yamamoto as applied to claim 7 does not disclose that the reproducing apparatus further comprises an auxiliary information demodulator for demodulating a differential signal outputted from the pickup.

Tsukihashi discloses an auxiliary information demodulator (Fig. 1, element 18) for demodulating a differential signal outputted from the pickup (Col. 3, lines 27-33). It is noted that the push-pull signal output from the pickup (Fig. 1, elements 1 and 2) is a differential signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the reproducing apparatus of Ohgo in view of Takeda and further in view of Ko and further in view of Yamamoto the auxiliary information demodulator of Tsukihashi, the motivation being to take advantage of auxiliary information stored on a disc and to make the reproducing apparatus of Ohgo in view of Takeda and further in view of Ko and further in view of Yamamoto compatible with information recording mediums that have wobble signals recorded thereon.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Ko in further view of Yamamoto and in further view of Tsukihashi.

Ohgo discloses an recording medium having: (a) a substrate (Fig. 1, element 2) having a microscopic pattern, having a continuous shape of approximately parallel grooves formed with alternating groove and land sections (Col. 16, lines 17-19); (b) a recording layer formed on the microscopic pattern (Col. 16, lines 24-26); (c) a light transmission layer (Fig. 1, element 6) formed on the recording layer; wherein the microscopic pattern is formed so as to satisfy a relation of $P < \lambda/NA$ (Col. 16, lines 19-20 and 37-39), wherein P is a pitch of the groove section or the land section, $\lambda$ is a wavelength of reproducing light beam and NA is a numerical aperture of an objective lens. It is noted that Ohgo discloses the thickness of the light transmission layer to be 0.1 mm and within a range of 0.07 to 0. 12 mm (Col. 10, line 41; Col. 12, lines 34-35; and Col. 13, lines 41-42) and that Ohgo does not disclose any thickness of the light transmission layer (Fig. 1,

element 6) other than 0.1mm. However, Ohgo does not specifically disclose the thickness of the light transmission layer used in Embodiment 9, which is the embodiment used in the present rejection. Ohgo also does not disclose that the land section is wobbled in the radial direction and having a wobbled shape corresponding to a superimposed wave comprising a phase modulated wave and a single frequency wave, the single frequency wave being superimposed on the phase modulated wave and having a frequency of integral multiples or one over integral multiples of a frequency of the phase modulated wave.

Takeda teaches that by using a light transmission layer (Fig. 1, element 5) with a thickness of 0.1 mm and within a range of 0.07 to 0. 12 mm, it is possible to use an objective lens having a high numerical aperture with a recording medium, reduce the laser spot size, and have an increased recording density (Col. 4, lines 10-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the thickness of the light transmission layer in the recording medium of Ohgo be within a range of 0.07 to 0.12 mm as suggested by Takeda, the motivation being to have a thickness of the light transmission layer of Ohgo that works with the high numerical aperture of Ohgo and to, as a result, have increased recording density. Ohgo in view of Takeda does not disclose a reproducing apparatus for reproducing from the recording medium. It is noted that the recording medium of Ohgo is supported on a turntable (Fig. 1, element 4) while rotating.

Ko discloses wobbling a land section (Fig. 6, "Land Track") is wobbled in the radial direction (Col. 5, lines 57-61) and having a wobbled shape corresponding to a superimposed wave (Fig. 10, "Land Recording Signal") comprising a phase modulated wave (Fig. 10, "Land Address Data" and Col. 6, lines 18-25) and a single frequency wave ("phase shifted wobble signal" of Col.

10, line 44 output from Fig. 10, elements 100 and 102 (Col. 10, lines 40-44)), the single frequency wave being superimposed on the phase modulated wave (Fig. 10, element 106 and Col. 10, lines 52-58) and having a frequency ("fw" of Col. 8, line 53 and Col. 10, line 41) of integral multiples or one over integral multiples of a frequency (1/("Tpid" of Col. 8, lines 45, 52 and 59)) of the phase modulated wave (Col. 8, lines 50-59 and note that fw is disclosed as preferably being integral multiples (i.e. 2, 3, 4, 5, 6 or 7 times 1/Tpid) of 1/Tpid). Ko teaches that doing so allows more data to be recorded in a recording medium (Abstract, particularly lines 15-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to wobble the land section in the recording medium of Ohgo in the radial direction and having a wobbled shape corresponding to a superimposed wave comprising a phase modulated wave and a single frequency wave, the single frequency wave being superimposed on the phase modulated wave and having a frequency of integral multiples or one over integral multiples of a frequency of the phase modulated wave as suggested by Ko, the motivation being to allow more data to be recorded in the recording medium.

Yamamoto discloses a recording apparatus comprising a recording medium (Figs. 10 and 11, element 11); the recording apparatus further including (d) a pickup (Figs. 10 and 11, element 10) composed of a light emitting element (Col. 14, lines 45-46) having a wavelength of $\lambda$ within a range of 350 to 450 nm (Col. 22, lines 22-23) and an objective lens (Fig. 10, element 20) having a numerical aperture of NA within a range of 0.75 to 0.9 (Cols. 19-20, Table 4 and Col. 3, lines 1-3) for reading out reflected light from and recording on the information recording medium; (e) a motor (Fig. 11, element 31) for rotating the information recording medium; (f) servo means for controlling to drive the pickup and the motor; (g) a turntable (inherent because the information

recording medium must be supported while rotating) for supporting the information recording medium while rotating; (h) interface (I/F) means (Fig. 11, element 33) for receiving the original information signal to be recorded; (i) modulator means (Fig. 11, element 33) for modulating the original information signal; (j) waveform converter (Fig. 11, element 33) means for converting the original information signal into a format suitable for a recording characteristic of the recording layer of the information recording medium (Col. 16, line 67-Col. 17, line 3); and (l) controlling means (Fig. 11, element 35) for controlling the entire recording apparatus (Col. 16, lines 48-49).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to record an original information signal on the recording medium of Ohgo in view of Takeda and further in view of Ko using the recording apparatus of Yamamoto, the motivation being to record original information on the recording medium. It is noted that the recording apparatus of Yamamoto comprises the recording medium of Ohgo in view of Takeda and further in view of Ko while the recording apparatus reproduces the information of the recording medium. Ohgo in view of Takeda and further in view of Ko and further in view of Yamamoto does not disclose that the recording apparatus includes (k) an auxiliary information demodulator means for demodulating a differential signal outputted from the pickup.

Tsukihashi discloses an auxiliary information demodulator (Fig. 1, element 18) for demodulating a differential signal outputted from the pickup (Col. 3, lines 27-33). It is noted that the push-pull signal output from the pickup (Fig. 1, elements 1 and 2) is a differential signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include into the recording apparatus of Ohgo in view of Takeda and further in view of Ko and further in view of Yamamoto the auxiliary information demodulator of Tsukihashi, the motivation being to take advantage of auxiliary information stored on a disc and to

make the recording apparatus of Ohgo in view of Takeda and further in view of Ko and further in view of Yamamoto compatible with information recording mediums that have wobble signals recorded thereon.

7. Claims 10-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo (US 6,269,072) in view of Takeda et al (hereafter Takeda) (US 6,512,735) and further in view of Tanase et al (hereafter Tanase) (US 6,240,056) and further in view of Abe et al (hereafter Abe) (US 6,381,208).

In regard to claim 10, Ohgo discloses an information recording medium comprising: a substrate (Fig. 1, element 2) having a microscopic pattern, having a continuous shape of approximately parallel grooves formed with alternating groove and land sections (Col. 16, lines 17-19); a recording layer formed on the microscopic pattern (Col. 16, lines 24-26); and a light transmission layer (Fig. 1, element 6) formed on the recording layer, wherein the microscopic pattern is formed so as to satisfy a relation of $P < \lambda/NA$ (Col. 16, lines 19-20 and 37-39), wherein P is a pitch of the groove section or the land section, $\lambda$ is a wavelength of reproducing light beam and NA is a numerical aperture of an objective lens. It is noted that Ohgo discloses the thickness of the light transmission layer to be 0.1 mm and within a range of 0.07 to 0.12 mm (Col. 10, line 41; Col. 12, lines 34-35; and Col. 13, lines 41-42) and that Ohgo does not disclose any thickness of the light transmission layer (Fig. 1, element 6) other than 0.1mm. However, Ohgo does not specifically disclose the thickness of the light transmission layer used in Embodiment 9, which is the embodiment used in the present rejection. It is also noted that the light transmission layer of Ohgo inherently has scattering within a range over the entire transmission layer. Ohgo does not

disclose that scattering of the thickness of the light transmission layer is within a range of ±0.002 mm over the entire transmission layer.

Takeda teaches that by using a light transmission layer (Fig. 1, element 5) with a thickness of 0.1 mm and within a range of 0.07 to 0. 12 mm, it is possible to use an objective lens having a high numerical aperture with the information recording medium, reduce the laser spot size, and have an increased recording density (Col. 4, lines 10-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the thickness of the light transmission layer in the information recording medium of Ohgo be within a range of 0.07 to 0.12 mm as suggested by Takeda, the motivation being to have a thickness of the light transmission layer of Ohgo that works with the high numerical aperture of Ohgo and to, as a result, have increased recording density.

Tanase discloses a light transmission layer (Fig. 4, element 62) formed over a recording layer (Fig. 4, element 63) wherein scattering of the thickness of the light transmission layer is within a range of ±0.002 mm over the entire transmission layer (Col. 7, lines 31-32). It is noted that the protection layer of Tanase (Fig. 4, element 62) is a light transmission layer because light must be transmitted through the protection layer to reach the recording layer (Fig. 4, element 63) (note position of reflecting layer (Fig. 4, element 65) in relation to the protection and recording layers in Fig. 4). Because the tolerable error of thickness of the light transmission layer is ±0.00001 mm, the scattering of the thickness of the light transmission layer is within the range of thickness of ±0.00001 mm, which is well within the range of ±0.002 mm.

Abe discloses that scattering of the thickness of a light transmission layer results in increased spherical aberration making correct recording to and reproducing from the recording medium impossible (Col. 2, lines 24-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the scattering of the thickness of the light transmission layer of Ohgo within a range of ±0.002 mm over the entire transmission layer as suggested by Tanase, the motivation being to reduce the amount of spherical aberration caused by the scattering of the thickness of a light transmission layer to a tolerable level and make recording to and reproducing from the recording medium possible as taught by Abe.

In regard to claim 11, Ohgo discloses that a record based on at least one of reflectivity difference and phase difference is performed onto either one of the groove and land sections (Col. 3, lines 66-67 and Col. 9, lines 25-30).

In regard to claim 12, Ohgo discloses that the wavelength $\lambda$ is within a range of 350 to 450 nm (Col. 16, lines 38-39) and the numerical aperture NA is within a range of 0.75 to 0.9 (Col. 16, line 37).

In regard to claim 13, Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo does not disclose that the recording is performed so that the modulated amplitude exceeds 0.4.

Applicant defines a modulated amplitude as a mathematical relationship in the form of a ratio (Page 62, lines 15-19). Examiner concludes that this mathematical relationship is known. Examiner interprets the specification (JIS Standard X6241: 1997) as establishing a range of

values for the terms of the mathematical relationship (I14H and I14L), hence establishing a range of modulated amplitudes.

In keeping with In re Peterson (65 USPQ2D 1379), it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the range of modulated amplitudes, the motivation being the inherent improvement of the optimization. Applicant's cooperation is respectfully requested in completing the search report by providing the Office with JIS Standard X6241: 1997.

In regard to claim 15, Ohgo discloses that the recording layer is formed by a phase change material (Col. 16, lines 24-26).

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Tanase and further in view of Abe as applied to claim 11 above, and further in view of Misawa et al (hereafter Misawa) (US 5,948,593).

Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo does not disclose that the recording is performed so that the modulated amplitude exceeds 0.4.

Misawa discloses a modulated amplitude of 0.65 that is more than 0.4 and teaches that this value is good (Col. 54, lines 5-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform recording on the information recording medium of Ohgo so that the modulated amplitude exceeds 0.4 as suggested by Misawa, the motivation being to perform recording with a modulated amplitude value that is good.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Tanase and further in view of Abe as applied to claim 11 above, and further in view of Watanabe et al (hereafter Watanabe) (US 4,651,172).

Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo does not disclose that the recording is performed so that the reflectivity exceeds 5%.

Watanabe teaches that when recording is performed with a reflectivity of less than 5%, the intensity of reflected light becomes lower and the signal/noise ratio of the reproduced signal deteriorates (Col. 2, lines 61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform recording on the information recording medium of Ohgo so that the reflectivity exceeds 5% as suggested by Watanabe, the motivation being for the intensity of reflected light to be high enough that the signal/noise ratio of the reproduced signal does not deteriorate.

*Response to Arguments*

10. Applicant's arguments filed September 14, 2005 with respect to claims 1-9 have been fully considered but they are not persuasive. Applicant argues that Ko fails to disclose the physical shape of the land track as currently claimed. However, the land track's wobbled shape is claimed as "corresponding to a recorded superimposed wave." Ko describes the superimposed wave (Fig. 10, "Land Recording Signal") that is recorded in a wall of a groove track (Col. 10, lines 40-58). Because a wall of a groove track defines a wall of the adjoining land track and because wall of a

land track defines the wobbled shape of the land track (Fig. 6), Ko's land track's (Fig. 6, "Land Track") wobbled shape corresponds to the recorded superimposed wave. Further, Examiner is unable to understand how the signal of Fig. 10 used to record a wall defining the wobbled shape of the land and groove tracks or even the push-pull signal of Fig. 11, which reads the information stored in the wobbled shape of the track and, as a result, corresponds to the wobbled shape of the land track, would not correspond to or be indicative of the physical shape of the land track. The additional claim limitations of claims 1-9 are met as discussed in the rejections above.

11. Applicant's arguments filed September 14, 2005 with respect to claims 10-15 have been fully considered but they are not persuasive. Applicant argues that the numerical limits of the present invention (±0.002 mm) are "quite different" from those of Tanase's (±0.00001 mm). However, even if numerical limits of the present invention are quite different than Tanase's, the claim limitation is met because Tanase's scattering of the thickness of the light transmission layer is within the range of ±0.002 mm even if it is well within that range. Abe provides the motivation for the scattering of the thickness of the light transmission layer to be within a tolerable range and is not used to provide the range itself.

*Conclusion*

12. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V. Battaglia whose telephone number is (571) 272-7568. The examiner can normally be reached on M-F, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. L. Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Michael Battaglia

BRIAN E. MILLER
PRIMARY EXAMINER